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A new subspecies of *Gyalidea asteriscus* from China[1]

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Abstract — The genus *Gyalidea* is reported for the first time from China. *Gyalidea asteriscus* subsp. *gracilispora* from deserts of northern China is described as new to science. Latin diagnosis, English description, and illustrations are given for the new taxon. A new combination, *G. asteriscus* subsp. *nigrescens*, is also made.

Key words — lichens, *Asterothyriaceae*, new Chinese record, taxonomy

Introduction

During the lichen study of arid and semiarid deserts from northern China, numerous specimens of apothecia with star-shaped margins (Figs. 2a–b) containing polysporic asci (Fig. 2f) were collected from soil and microbiotic crust in the arid land of Hebei, Shanxi, Ningxia, Gansu, and Qinghai. The lichen examined is close to both *Solorinella asteriscus* and *S. nigrescens* (Thor 1984) in habit and chemistry, but differs in its wider paraphyses, smaller asci, and narrower ascospores. *S. nigrescens* has been reduced to subspecific rank as *S. asteriscus* subsp. *nigrescens* (Vězda, Lumbsch & Øvstedal, 1990).

The genus *Solorinella* has recently been transferred to the genus *Gyalidea* based on phenotypically phylogenetic analysis, and the species *S. asteriscus* has been recombined as *G. asteriscus* (Aptroot & Lücking 2003). Our collections from the desert in China represent a new taxon, *G. asteriscus* subsp. *gracilispora*. In keeping with these recent nomenclatural changes, we transfer *Solorinella asteriscus* subsp. *nigrescens* to *Gyalidea* under the new combination, *G. asteriscus* subsp. *nigrescens*.

The lichen genus *Gyalidea* (*Asterothyriaceae*, *Ostropales*, *Ostropomycetidae*) is reported for the first time from China.

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Material and methods

The specimens studied were collected from the microbiotic crusts in the arid land of Hebei, Shanxi, Ningxia, Gansu, and Qinghai. The dissecting microscope (Leica MZ8) and compound microscope (Zeiss Axioskop 2 plus) were available for morphological and anatomical studies, and color test and standardized TLC was used for detecting of lichen substances (Culberson & Kristinssen 1970, Culberson 1972, Culberson & Johnson 1982, White & James 1985).

Taxonomy

Gyalidea asteriscus (Anzi) Aptroot & Lücking, Biblioth. Lichenol. 86: 67 (2003).

Basionym. *Solorinella asteriscus* Anzi, Catal. Lich. Sondr. p. 37 (1860).

Gyalidea asteriscus subsp. ***gracilispora*** Jun Yang & J.C. Wei, **subsp. nov.**

MycoBank MB 513530 Figs. 1, 2.

Subspecies nova habitu et substantia cum Gyalidea asteriscus *subsp.* asteriscus *et* G. asteriscus *subsp.* nigrescente *optime congruens, sed differt paraphysibus crassioribus, ascis brevioribus et parvulioribus, ascosporis gracilioribus.*

Type collection: Hebei, Mt. Xiaowutai, south of Jinghekou management area, N39°56′, E 114°56′, alt. 1190 m, on soil, 15 April 2005, Hai-Ying Wang & Xin-Li Wei, 3058 (**holotypus** - HMAS-L).

Etymology: Latin: "*gracilispora*" = narrow ascospore.

Apothecia with deep concave discs of dark brown to black color and of 1.1–1.8 mm in diam. bearing white star-shaped margins consisting of 4–8 triangles or cones of white lobelet. Margins star-shaped, white, paraplectenchymatous, lobelets 10–150 µm wide at top and 300–350 µm wide at bottom, 200–300 µm high; epithecium brownish, 25–30 µm thick; hymenium K–, I–, hyaline to pale brownish, 105–145µm thick; hypothecium hyaline to pale brownish, 25–35 µm high; paraphyses hyaline, unbranched, septate, 2–3 µm thick; asci cylindrical with apex structure of *Tremolecia*-type, polysporic, 52.5–72.5(–82.5)

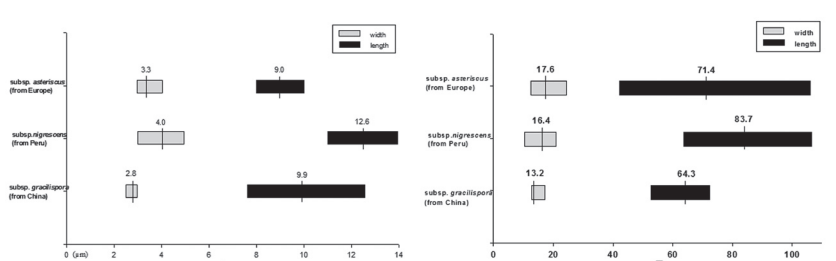

Fig. 1. Comparisons of ascospore (A) and ascus (B) size among three subspecies of *G. asteriscus*. Data for subsp. *asteriscus* and subsp. *nigrescens* are from Thor (1985, "1984").

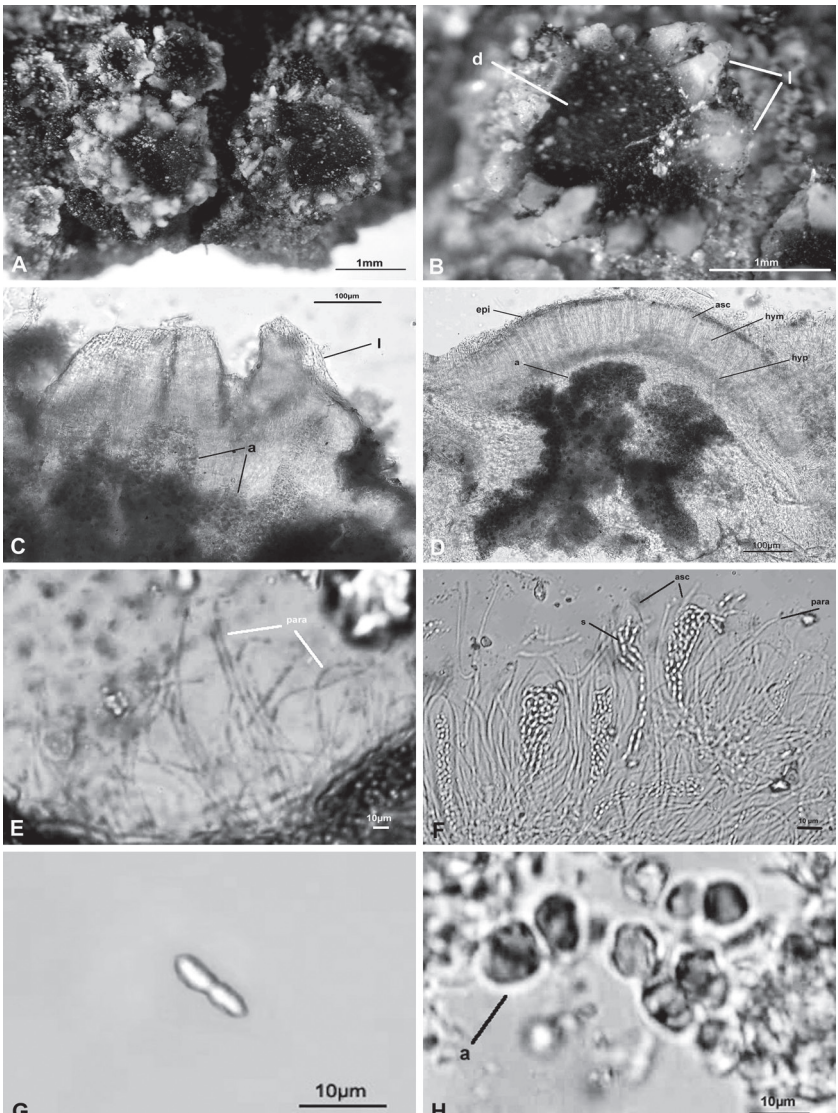

Fig. 2. A. The habit of *G. asteriscus* subsp. *gracilispora* (bar = 1 mm); B. One apothecium with star = shaped lobes at margin (bar = 1 mm); C. Cross section of a star = shaped lobe (bar = 100 μm); D. Cross section of an apothecium (bar = 10 μm); E. Septate paraphyses in cotton blue (bar = 10 μm); F. Asci containing spores (bar = 10 μm); G. An ascospore; H. Algal cells.

(a = algal cells; asc = ascus; d = disk of apothecium; epi = epithecium; hym = hymenium; hyp = hypothecium; l = lobe; para = paraphyses; s = spores)

× (10–)12.5–17.5 µm; ascospores hyaline, oblong ellipsoidal, 2-celled, 7.5–12.5(–17.5) × 2.5–3(–3.5) µm.

Conidiomata not seen.

Chemistry: no lichen substances detected by TLC; all parts C–, K–, KC–, PD–.

Phycobiont belonging to *Chlorococcaceae*, 7.5–10 µm diameter.

Habit: on soil of the microbiotic crusts in arid land.

Additional specimens examined: **HEBEI:** Mt. Xiaowutai, south of Jinghekou management area, N39°56′, E 114°56′, alt. 1190 m, on soil, 15 April 2005, Hai-Ying Wang & Xin-Li Wei, 3041, 3043, 3052, 3053, 3056 (HMAS-L); Fengning County, Xiaobazi Village, on soil, 24 April 2004, XBZ038 (HMAS-L). **SHANXI:** Yanggao County, Xiejiatun Village, on soil, Jun Yang & Tao Zhang, 23 September 2004, SX039 (HMAS-L). **NINGXIA:** Zhongwei, Shapotou, on microbiotic crust, 6 August 2003, Jiang-Chun Wei & Jun Yang, SPT372 (HMAS-L). **GANSU:** Weiyuan County, Mt. Junshan, 28 October 2004, on soil, En-Ran Zhang, GS055, GS067 (HMAS-L). **QINGHAI:** Gonghe County, Qiabuqia, alt. 2910 m, on soil, 10 September 2005, Man-Rong Huang & Jun Yang QH030 (HMAS-L).

Remarks: The new subspecies is identical to *G. asteriscus* subsp. *asteriscus* and subsp. *nigrescens* in habit and chemistry but differs in its wider paraphyses, thinner ascospores, and smaller asci.

We recognize three *G. asteriscus* subspecies: subsp. *asteriscus* from Europe, subsp. *gracilispora* from China, and subsp. *nigrescens* from Peru:

Gyalidea asteriscus subsp. ***nigrescens*** (G. Thor) Jun. Yang & J.C. Wei, **comb. nov.**

MycoBank MB 514070

Basionym. *Solorinella nigrescens* G.Thor, Nord. J.Bot. 4(6): 823 (1985, "1984").

≡ *Solorinella asteriscus* subsp. *nigrescens* (G.Thor) Vězda, Lumbsch & Øvstedal, Nova Hedwigia 50(3–4): 528 (1990).

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Literature cited

Aptroot A, Lücking R. 2002. Proposal to conserve *Gyalidea* (lichenized fungi: *Asterothyriaceae, Ostropales*) against an additional name, *Solorinella*. Taxon 51 (3): 565.

Aptroot A, Lücking R. 2003. Phenotype-based phylogenetic analysis does not support generic separation of *Gyalidea* and *Solorinella* (*Ostropales*: *Asterothyriaceae*). Bibliotheca Lichenologica 86: 53–78.

Culberson CF. 1972. Improved conditions and a new data for the identification of lichen products by a standardized thin-layer chromatographic method. J. Chromatography 72: 113–125.

Culberson CF, Johnson A. 1982. Substitution of methyl tert.-butyl ether for diethyl either in the standardized thin-layer chromatographic method for lichen products. J. Chromatography 238: 483–487.

Culberson CF, Kritinssen H. 1970. A standardized method for the identification of lichen products. J. Chromatography 46: 85–91.

Thor G. 1985 ("1984"). A new species of *Solorinella* (*Asterothyriaceae*) from Peru. Nord. J. Bot. 4(6): 823–826.

White FJ, James PW. 1985. A new guide to microchemical techniques for the identification of lichen substances. Bul. British Lichen Soc. 57(suppl.): 1–47.